CGIAR Challenge Program on
WATER & FOOD

Submission Document

Volta Basin Development Challenges of the CPWF

To improve integrated management of rainwater
to improve smallholder productivity and livelihoods and reduce risk

CPWF-L4: Water Governance in the Limpopo Basin

16 January 2011

PART A: SUMMARY

1. Project Data

BDC: Integrated management of rainwater to improve smallholder productivity and livelihoods and reduce risk.
Project Title: **CPWF-L4 Water Governance in the Limpopo basin**
Project Lead Organization: **WaterNet**
Consortium partners (who receive budget): **WaterNet, IWEGA, IWMI, University of Zimbabwe**
Project Leader (name and contact details): **David Love, WaterNet, PO Box MP 600, Harare, Zimbabwe**
Duration: **3 years**
Target start date: **1st February 2011**
Finish date: **31st December 2013**
Maximum budget requested from CPWF (in US$): **USD 875 000**
Any matching funds offered (provide brief explanation): **Staff time of WaterNet Manager and Research Coordinator, in kind contributions from WaterNet and IWEGA (e.g. student and travel support). It is hoped that at least one PhD fellowship will be secured**.

2. Project Summary

The project focuses on access and control of water/land, and the associated management and governance mechanisms. L4 seeks to provide the people and governments of the Limpopo Basin with:

1. A package of ways to better understand and organise access rights to water for multiple uses from farm level to the basin and regional level,
2. A package of ways to organise technologies for different physical and socio-economic contexts so as to improve the management and control of water for multiple uses from one or more water sources,
3. A suite of policy and legal options to support agriculture-based livelihoods in which water plays a vital role, and
4. A set of institutional arrangements that is appropriate for different classes of smallholder farmers including the resource poor, women farmers, and other disadvantaged groups.

The issues that have been raised above encompass the full water cycle, which makes it important to consider at the same time management of rainwater (for rainfed agriculture and rainfed pasture, for example) – the green water component – alongside the better management of runoff, groundwater and stored surface water - the blue water component. This has important social and institutional implications – and also policy and legal implications, as southern Africa moves from the management of shared flowing water to the management of rainfall across the shared basins such as the Limpopo (Ncube et al, 2009). All water uses are mediated by various types of water management institutions, formal and informal, hence the centrality of institutions in this project. Institutional analysis, which is a critical component of governance in general and water governance in particular, will be grounded in this study within the social, economic and political domains where issues of power differentials due to socio-economic status, gender and ethnicity, among other factors, will be critically analysed. The focus will be on 1) how formal and informal institutional arrangements constrain or promote access to water, and influence the success of the various interventions that have been and are being tried in the basin 2) to what extent the various institutions are effectively coordinated,

and are able to facilitate the participation of various stakeholders including local people, the so called beneficiaries, 3) the relationship between the biophysical and socio-economic domains and how these have been satisfactorily taken into account by outside actors, and 4) the impacts of the interventions on the livelihoods of participating households and communities in the short and long term.

This project will therefore emphasise a trans-disciplinary and integrated approach to the management of blue and green water at various hydrological, administrative and jurisdictional scales and levels. The work package approach will be used for the implementation of L4. The intention is that, at the minimum, there is one case study site per riparian state. Because of the different foci of the work packages each work package will not undertake research activities in each riparian state although attempts will be made to promote collective learning.

PART B: PROJECT DESCRIPTION

3. BDC Goals to which the project will contribute

Briefly list the BDC Goals that have been developed during the project development workshop and how the project will contribute to their achievement.

The BDC goal is "improving governance and management of rainwater and small water infrastructure in the Limpopo basin to raise productivity, reduce poverty and improve livelihoods resilience." The goal of this project is to improve access to and control of water for rural communities (from farm to basin level), improve management of the technologies they use to access water as well as increase the value of related goods and services. It is expected that this will increase the productivity of water-related farming enterprises and potentially raise agricultural output of the various livelihood strategies which use water as a major input. The expected food and water security should in turn reduce household poverty and make a contribution to increased household, national and basin-level resilience to climatic, social and economic stresses that are common in the basin.

4. Research questions and methodologies

This project is primarily aimed at orientating water governance praxis (herein simply defined as practical application) in the Limpopo basin for the benefit of at least 7 million people who depend on agriculture for their livelihoods. This is against a backdrop of state-driven top down attempts at reforming water governance coupled to a proliferation of normative regional and national development frameworks. The noble attempts have not always produced results at the local level, which has seen civil society and research institutions address the shortcomings with variable results. Of interest to this project are governance systems relating to the various 'intervention platforms' that are commonly found in the basin such as enhanced rainfed farming (mainly conservation farming), crop-livestock interactions, and management of small water infrastructure such as multipurpose dams. The first two are closely associated with L3 while the third is related with L2. In order to unpack water governance praxis a number of questions are posed. What are the existing normal and formal water and development frameworks at local, national, basin and regional level, and how do they take into account the socio-economic circumstances of the different farmers (including women farmers and other disadvantaged groups)? What have been the main constraints hindering the adoption and implementation of the various policies, and how can these be improved in terms of relevance, effectiveness and impact for local communities? What are the social and economic factors that explain the success and failure of some of the recommended innovations (e.g. conservation farming, institutionalization of MUS in water infrastructure projects, and market-led intervention such as contract farming) and why they are or are not adopted by different farmers? What alternative arrangements can be designed in order to improve the situation?

The work package approach will be used for the implementation of L4. The intention is to have one case study site per riparian state. Since research carried under the auspices of the work packages differs in terms of focus and detail, some work packages will not cover all the riparian countries (see below). The following work packages have been identified and will be carried out collaboratively by partners for greater integration:

- Work package 1: Multi-level governance options for improving access to water and poverty reduction

- Work package 2: Governance aspects of design, operation and rehabilitation and management of multiple use system infrastructure
- Work package 3: Socio-economic aspects of farming systems and linkages to river basin organizations
- Work package 4: Triangulation and integration, coordination and capacity building

Work package 1: Multi-level governance options for improving access to water and reduce poverty. The global objective of the WP is to contribute to the consolidation of multi-level governance mechanisms for improved water management in the Limpopo basin, with a specific focus on assessing the needs of vulnerable social groupings. Governance can be understood as the norms and rules of interaction between groups of actors involved in natural resource use, and the resulting power relationships between these groups (Meadowcroft 2002; Rist et al. 2006). Multi-level governance results from the combination of functional links between hierarchical levels, the mobilization of other types of interaction - network, lobbying, social links, interpersonal relationships - and power mechanisms (e.g.: mechanisms of resistance, cooperation and domination) (Rosenau, 1990; Bakis, 1993; Molle 2009). Consequently the work will be organized around two intertwined activities: (i) analysis of the pro-poor mechanisms in water management arrangements and how these are translated from the transboundary basin level to national and local levels, as well as how these are affected by other related resources such as land and markets, and (ii) research-informed formulation of different multi-level governance options for various vulnerable stakeholders in 'normal' and extreme climatic events such as droughts and floods.

The main idea is to explore whether and how the pro-poor clauses are incorporated in national, basin and regional frameworks, and understand why such clauses remain under utilised (e.g. many smallholders do not take advantage of the entitlements that are provided for under primary water) and what alternative governance options are possible. It will benefit from input from WP2 and WP3 with their focus on local issues regarding land and water uses, and the related institutional arrangements as explained below.

The first task will be to undertake an inventory of pro-poor clauses in water policies and legislation of the various countries and also provisions at the regional and basin level. It will explore how the institutional and socio-technical settings at local, national and regional level incorporate the pro-poor elements and how these are or are not being mobilized by actors whether in discourse or in, practice. The practical question is to what extent are strategies being employed by vulnerable groups and whether these strategies are effectively addressing the environmental risks (such as droughts and floods that are common in the region). The work will also interrogate the widely documented underdevelopment that is found in the region. The team will first elaborate a collective framework of analysis of multi-level governance that integrates land, water and other complementary resources. This framework will be applied in the four riparian countries, and will be based on literature.

The second part will analyse how multi-level institutional arrangements (whether formal or informal) affect the vulnerability of local farming livelihoods using a participative simulation approach. Field work will be developed in two sites of the same South African/Mozambique transboundary sub-catchment of the Limpopo basin. The two countries were chosen because of their respective position (Mozambique is downstream and less developed while South Africa is upstream and is more developed). LIMCOM will be consulted in selecting the specific catchment and the important issues to focus on. Operationalising multi-level governance means

understanding that there are different issues that are relevant at the different scales and levels. For example at the basin level, water allocation is considered within basin and issues of regional economic development and integration are pertinent, while at the country level, in South Africa for instance, the question may be more about the reconciliation of allocations at catchment level with competing local water demands. In Mozambique the question of environmental flow requirements is important as is water availability for local communities including adaptation to drought. A modelling approach at a sub- catchment level will be used in both Mozambique and South Africa. This type of participative modeling and simulation (Voinov and al, 2010) approach has proved to be particularly interesting in supporting social learning of complex natural resources management issues and for adaptive management (Etienne, 2010). The MCC will lead engagement about possible governance models with its sister RBOs, riparian states' and LIMCOM. In the simulation inputs from WP2 and WP3 in the form of governance scenarios for specific issue are expected to be incorporated in order to test and discuss their coherence with higher level institutional settings. The work developed in this specific bilateral situation will be extrapolated to the basin level through discussions with policy, development actors, and research partners.

Work package 2: Governance aspects of the rehabilitation and management of multiple use system infrastructure.

The focus of the research is on improving the sustainability and resilience of multiple use water point infrastructure through an assessment of contextualized governance, which is appropriate for particular situations. Approaches will be related to social institutional aspects of infrastructure design, operation and rehabilitation at the local level and how these interlink with higher levels (such as at the national, regional and basin level). Through the use of the decentralization framework (Ribot 1999, 2002) WP2 intends to look at both formal and informal institutions and how the different institutional arrangements are impacting on the sustainability of the water infrastructure and livelihoods of people using these. Work Package 2 will map out who the actors are, what powers they have, and what are the existing normative and practical accountability mechanisms (Ribot 2002). The different water uses will be studies as they impact on whether the water infrastructure is used for multiple purposes or not (Van Koppen et al 2006). WP 2 will also look at gender analysis at the local level and how this articulates with the sub-national and national, and regional levels. The Gender Performance Indicator for irrigation (Van Koppen 2002) will be used to understand what is happening in the case study sites both in terms of policy and practice.

How MUS systems are undertaken in practice will be achieved by comparing the adoption and implementation of MUS with respect to local and national dams. This is because national level dams are often operated by technicians who are less inclined to take account of multiple local water needs. There will also be comparison of water projects where different types of water infrastructure are in place. For example there may be differences in the way MUS can be applied in a water source/infrastructure, which is dedicated to domestic water compared to another where multiple water uses were envisaged such as a small dam. Apart from the social aspects, effort will also be made to assess how physical availability of water influences the institutional arrangements. Specific focus will be on assessing institutional relevance and preparedness as far as promoting pro-poor water governance systems.
Effort will be made to assess the relevance for local livelihoods.

WP2 is centered on the management aspect: how do local institutions design, implement, enforce and adjudicate on the rules and regulations for the management of land and water resources. The next aspect will be how do these local rules intersect with top-down, nationally derived land and

water management through formal law. This section will assess how the management is impacting on the farmers livelihoods in the case study countries. This WP will aim to identify mechanisms to enable the land and water management which is pro-poor and meeting the livelihood requirements of poor men and women in the basin. This research intends to address gender issues since women are increasing the *de facto* farmers due to rural-urban migration and due to the impact of HIV/AIDS.

Research will be carried out in the geographic location of study sites where research for work package 3 will be undertaken. In practice this means that irrigation schemes and other water points in a ward in which innovation platforms will be chosen in order to achieve synergy between different aspects of the research. A number of research tools to address the multifaceted nature of the research objectives will be used. First, participatory research tools will be used with the different community members (men, women, youth) to map the institutions, their roles and their perceived powers – and to ensure full stakeholder engagement with the research. Second, key informant interviews will also be carried out starting at community level to the national level as appropriate. Third, questionnaires surveys will be carried out using randomly stratified samples. Fourth, since power and gender analysis entails deep ethnography, the researcher with research assistants will have to spend a lot of time in the field in order to get a better understanding of the power, processes and gender dynamics.

Work Package 2 will largely work collaboratively with WP3 and try as much as possible to have synergies with Project L2. However, for any meaningful depth the geographical focus for WP2 will be South Africa (Lambane and Nebo plateau) and Zimbabwe (Gwanda and Insiza districts). WP2 will also work on Flag Boshielo Joint-Venture scheme in Sekhukhune District, South Africa. This specific case study offers an opportunity to assess an alternative model where former white farmers are going into joint ventures with small scale irrigation land owners with the support of the government. The question is what lessons of experience does this offer for other basin countries on improving the livelihoods of the small scale farmers? It is anticipated that valuable lessons will be learnt regarding the role of the state in multiple use irrigation systems (and implications at the basin and regional level), design, operation and rehabilitation of MUS systems, and the attendant governance mechanisms for effective and sustainable MUS systems.

Work package 3: Socio-economic aspects of farming systems and linkage to river basin organisations

This work package aims to increase access to and control of water, land and other resources at farm and village level by smallholder farmers through determining to what extent and how best households can benefit from local realities and national, regional and basin initiatives. The farm system is understood to include all aspects of a family's livelihood strategies but to focus upon (large and small) livestock production and (rainfed and irrigated) cropping.

The primary focus is on how innovations (do or do not) shape access and control of resources by farmers of different socio-economic status. This is because successful innovations can have both intended and unintended consequences. For example, it is known that women farmers lose control of fields when cash crops are successfully promoted. Thus the beneficiation of rainfed farming systems in the basin, for example through water conservation, the production of fodder crops for livestock or increased access to markets of the outputs, can in addition to the positive elements, have negative consequences. Less powerful members of communities such as immigrants and female-headed households may lose their rights to traditional and common pool resources. The study will therefore assess the both positive and negative impacts of the

innovation platforms on different farming households. An analysis of the conflict resolution mechanisms that deal with such situations will be assessed. This will be done by assessing the relevance of existing formal and informal institutions at different levels, and how these improve local livelihoods through enabling better access to natural and other resources.

Critical steps that will be followed include identification of the relevance and impact of water/land policies at household and farm level including an assessment of alignment between water and land reform through case studies (link to work package, 1) undertaking a baseline survey focusing on livelihoods options strategies and relevant social organization, characterising 'innovators' and 'non-innovators' and the basis for such labels, and the impacts of the various innovations on local livelihoods. Effort will also be made to assess the extent to which the 'innovation message' is being promoted by different innovation platforms, how the message resonates with local farming livelihoods and social organization, and how the message can be changed in order to make it more relevant.

Assessment of the relevance of the various innovations will be done through participatory monitoring (this will involve farmers and stakeholders in extension and the NGO sector) of the interventions including assessing not just the benefits of the innovations, but the transaction costs as well. It is expected that this will improve decision-making by different farming households as they strategically take account of their local biophysical and socio-economic circumstances as well as opportunities offered by the wider policy, legal and development environment.

The main theory that informs the work package is that of sociology of development which rejects simplistic modernization approaches to smallholder agriculture where modernization is visualized as a progressive movement towards technologically and institutionally more complex and integrated forms of a modern society. The argument is not that smallholders should stay clear of innovations but rather different routes to development are possible, and that linear models of development in general and technology in particular are often to blame for non-adoption of technologies (Hebinck and Verschoor, 2001). Such an actor-oriented approach sees smallholder farmers not as passive beneficiaries of technology but as active agents who write 'their own story' on the canvass that intervention technologies provide (Long and van der Ploeg, 1989).

The work package will closely work with CPWF-L3 project, and will undertake research on the innovation platforms that L3 will focus on. It will, however, include other innovation platforms for comparison. The exact cases will depend on the initial survey that will be undertaken to determine the range of innovation platforms. A provisional list includes a) conservation farming promoted mainly by non-state actor(s), b) ICRISAT 's crop-livestock interactions project, c) a local authority-promoted innovation platform, and d) improved marketing platform e.g. contract farming. Given the detailed analysis that will be undertaken the work will be confined to South Africa (Lambane and Nebo plateau) and Zimbabwe (Gwanda and Insiza districts). Both countries have a strong agricultural history. The research personnel that will be involved include two senior scientists, one PhD student and one MSc student.

Work package 4: Triangulation and integration, coordination and capacity building

Research efforts conducted under the auspices of Phase 1 of the Challenge Program on Water and Food and other agencies pointed to five main problems and WP4 has been included to minimize risk and maximize lessons learnt from Phase 1, avoiding pitfalls and repeating shortfalls. All three work packages themselves reflect on work being done within parallel work packages but the task of WP4 is to consolidate these reflections and stand outside of each work package, examining

conflicting or reinforcing research findings. Triangulation can be considered as an alternative form of validation (Denzin & Lincoln 1998; Fielding & Fielding 1986) and in this context it allows contradictory, or similar, evidence across sites and across themes for all three packages to be considered. Similarly, there are theoretical frameworks that are the scaffold for each WP, including for instance, governance, institutions, poverty, gender and development, underdevelopment and the sociology of development. In this way, the concern that there was a lack of co-ordination and consolidation between different research thrusts in Phase 1 is well addressed. WP4 ensures that the main themes of each work package are brought together. WP1 has its focus on multi-level governance options for improving access to water and poverty reduction. This package has a focus on pro-poor policies and examines the way in which these are implemented at various scales. Linkages will be made between the adoption (or not) of these pro-poor policies and the multi-level governance options will inform the overall findings for WP2 and WP3. WP1 interrogates the theme of underdevelopment and the way this manifests in all four research sites. WP2, for instance, has its focus on improving the sustainability and resilience of MUS point infrastructure and it contextualises governance options around the infrastructure as well as capturing what Merrey (2009) and Manzungu et al (2008) considered as the vibrancy of different institutions operating at particular sites. This work resonates with the work in WP1 and WP3. It is the responsibility of WP4 to share and disseminate systematically and methodically findings that emerges and to integrate them into the main points emerging from each WP. WP4 will take the theme of poor adoption of pro-poor policies, for instance, and reflect on the way in which this plays itself out at different levels and scales.

Another task is to repackage scientific results and to communicate these results in such a way that they are accessible to farmers, extension agents, policymakers, NGOs etc. The wider research agenda of development in the region will be addressed – and the WP4 of Phase 2 makes deliberate links with government agents and policy actors in the region. It also renders coherent the fragmented findings of different disciplines so that the interventions and recommendations are packaged in a way that makes them accessible across discipline. The challenge in WP4 is to be cogniscent of the multiple themes running through the three work packages, the multiple geographical scales of intervention of the research and to make use of opportunities to communicate these findings coherently to clients (government etc.) as well as the research team who have different expertise and disciplinary backgrounds.

Triangulation, co-ordination, integration and capacity building will begin at the onset of the project and will run throughout the project parallel to all other activities. Capacity building of individuals, groups, institutions and organisations will help to identify and solve problems over time (Morgan 1993, UNDP 1993). Capacity is also the ability to perform appropriate tasks effectively, efficiently and sustainably. This implies that capacity is not a passive state but that it is part of an active process (Hildebrand and Grindle 1994) and capacity building is an integral part of WP4. In this way it is not an add-on at the end of the project and there is time to consolidate, access, co-ordinate and package the project results. However, capacity building must be mainstreamed into the research process, and not carried out a as a late-stage response to research already completed or nearing completion (Love et al, 2008). Therefore, the capacity building component is also an integral part of the project and includes research seminars, academic writings (peer reviewed papers and working paper series) and reports. Working closely with CPWF-L5 project, this work package is meant to assure quality and consistency for the three work packages. It will deal with:

- Compilation of Phase I results and data (emerging water governance issues in the Limpopo Basin).

- Collaborative research with work packages 1-3 to build the science behind the Project Impact Narrative and the improvement of the resilience of rural livelihoods. This will include integrated green water, blue water and infrastructure planning at farm and community level and harmonization of sectoral planning approaches at government level.
- Masters fellowships, which are mainly allocated to river basin organisations (RBOs), so as to ensure that project outputs are embedded in the RBOs.
- It is hoped that at least one PhD fellowship will be secured with matching funds.
- Co-ordination of regular inputs by WP1,2 and 3
- Alignment of common narratives and empirical evidence that resonate through WP1, 2 and 3
- Identification of relevant themes from a WP 1- 3 that could add value to a country perspective or issue
- Identification of main emerging constraints and opportunities of WP1-3 activities (inputs and outputs)
- Training events on research methods and presentation of findings
- Working paper series on research methods and presentation of research findings is designed to build socio-economic research capacity in the region
- Indicator development will be part of the capacity building research component and the project will present a set of indicators that is relevant for WP1 – 3 and that can be used subsequently as a work tool for research on similar issues – indicators will be refined and expanded as the project progresses and the development of indicators will be a process that engages the researcher but also the researched. Indicators will thus be developed in synergy between actors from the bottom-up and top-down
- A meta-analysis of the process will be conducted so that any 'mistakes' will become 'lessons learnt' and clearly and readily shared from the beginning of the project to its closure. In this way the research itself (input) is a learning process. Gaps or errors in communication between WP 1-3 (and 4) – or/and gaps in co-ordination and communication, for instance, between government partners and the research team, are in themselves important learning points and these will be documented alongside the positive learning experiences gained through the project.
- A training manual on how to conduct trans-disciplinary research will be drafted

Choreography of the team:

In addition to this work package, the project comprises three outputs that are focused on particular aspects of water governance (work packages 1, 2 and 3) which are led by IWEGA, IWMI and UZ, and two outputs which are synthetic and integrative, which are led by WaterNet (work packages 5 and 6). Additionally, researchers from each institution will contribute to each work package (see Gannt), which will help ensure information exchange between work packages and the smooth delivery and sharing of research results and outputs. The integrative work packages (5 and 6) will work with work packages 1, 2 and 3 to synthesise research and build up the overall project "story".

IWEGA, IWMI, WaterNet and UZ will coordinate field work in Mozambique, South Africa, Botswana and Zimbabwe respectively.

A Project Management Team, comprising the Project Leader and a senior representative of each partner, shall meet at least twice annually: once in person and once by skype-conference, to review progress and discuss any issues of concern.

All partners are committed to producing the outputs specified in the Gannt, and to producing them timeously and at a high scientific quality. Disagreement as to the implementation of the project or the delivery or completion of any output shall first be discussed between the Project Leader and the responsible partner and then referred to the Project Management Team if necessary. Any matter which cannot be resolved by the Project Management Team shall be referred to the Basin Leader for mediation.

Work package 5: A gender balanced approach to harmonise green water, blue water and infrastructure planning at farm & village level

This work package aims to implement catchment planning at village level, integrating water point management, rangeland and cropland planning, livestock management, catchment protection and water resource allocation.

The work shall be carried out through a case study approach of at least three study sites, integrating the village level work of work packages 1, 2 and 3. The case studies will incorporate gender mapping and an analysis of the nexus between green water management, blue water management and infrastructure at village level. The case studies will then move to participatory planning by the farmers, facilitated by the researchers and with involvement of extension services and RBOs.

Work package 6: Harmonise green water, blue water and development management and planning at government level

This work package aims to integrate the outputs of work packages 1, 2 and 3 at national and transboundary basin level. The primary focus will be on the harmonization of the planning and management of development between the various development agents and moving away from the sector-based approach. This means moving from disparate approaches such as water supply planning and agricultural planning to an integrative development paradigm that combines IWRM and INRM and specifically addresses gender aspects and constraints in planning. This should lead to water planners within river basin organisations and governments incorporating rainfed farming and land use planning into their catchment and water supply plans and development partners integrating water access and availability issues into their infrastructure planning.

The first stage in this work package is preparing an inventory of water management and planning mechanisms in the four riparian states and identifying gaps, linkages and opportunities. A government management and planning approach to infrastructure development shall be developed, through consideration of the MUS paradigm and iterative discussions with the river basin organisations (led by the Mzingwane Catchment Council) and the riparian governments. The implications of the research findings and the recommendations will be discussed with SADC Water Resources Technical Committee. Research briefs will be developed and presented to the SADC meeting.

5. Links to previous and ongoing work

What – if anything – has been done to address the problems in the past (by your partners, other researchers and in CPWF Phase one projects) that is relevant to implementing this project? What are the key lessons learnt that you will consider in the present project? (Include in Section 16 a carefully selected list of relevant bibliographic references).

The Second World Water Forum that was held in the Netherlands in 2000 popularised the saying that the world water crisis was a crisis of governance. However, attempts at operationalising water governance at the local level has been beset with problems relating to inadequate conceptualisation of governance in terms of what it actually means and entails (Cleaver and

Franks, 2008), and the false notion that all states can follow the same governance trajectory (Swatuk, 2010). Research conducted under CPWF Phase one also revealed that some of the IWRM principles, such as subsidiarity, remains untested at the local level in terms of what is local and how the 'local' level articulates with higher levels (Fatch et al, 2009). Besides, in southern countries, the inclusion of objectives of poverty alleviation and social equity often collides with dominant economic development perceptions, practices and discourses (Molle, 2009). This is against a situation where water-related risks such as droughts, floods and pollutants, are not spread homogeneously through societies as suggested by the dominant economic paradigms (Beck, 2001 ; Cardona, 2004). Vulnerability to risk is amplified by differential access to water resources. Specific geographical and socio-economic contexts, as well as the role of the state, become central in addressing vulnerability. Improving governance mechanisms can make a meaningful contribution to local livelihoods, hence the focus on water governance in this study.

This observation resonates with concerns that have been raised with the practicalities of implementing IWRM (Biswas, 2004 cf. van der Zaag, 2005) against a backdrop of competing natural resource management frameworks (Twomlow, et al, 2008), and the socio-economic realities (Swatuk, 2010). One area that needs attention is how to capture and mainstream the vibrancy of local level institutions (Merrey, 2009), which often operate with different set of concepts as was found in Botswana and Zimbabwe (Manzungu et al, 2008; Manzungu et al, 2009a). These are the issues that Work Package 1 will examine by analysing whether current water governance regimes are 'fit for purpose' as far as securing farming livelihoods is concerned, and how the provisions provided for by these site specific institutional solutions could be exploited to the advantage of the farming communities. Another area that requires attention is how to better coordinate land and water management institutions to manage rainwater and not merely blue water (Ncube et al, 2009). This is an issue for Work Package 5 at farm and village level and Work Package 6 at national and transboundary level.

This project therefore seeks to understand how better governance can lead to better livelihood outcomes through an understanding that governance is about better coordination of actions for effective decision making by one or many actors (Williamson, 1985 ; North 1991). In collective action situations, governance deals with such aspects as coordination between multiple uses and stakeholders, and rural-urban interface. How these coordination mechanisms are organized and impact on different stakeholders is an important line of enquiry. The relationship between management tools and the relevant social organization is also critical (Moisdon, 1997). Governance also implies reorganization and reconfiguration of roles (Lascoumes et Le Gales 2007; Majone 1986; Theys, 2002), the 'rules of the game' (Hoeffler et al, 2006), and creates arenas where ideas and representations are confronted, and where norms and values are re-intepreted (Borraz, 2004). Power relationships (Meadowcroft, 2002) explain how and why some issues are being taken into account in institutions and not other ones. The perceptions communities have of formal institutions and their roles can highlight gaps to improve both stakeholder participation and institutional function (Nare et al, 2006).

The project thus seeks to identify collective action with respect to water governance in rainfed systems where individual and collective action intersect (WP3), between water users mobilized around the same infrastructure (WP2) or between stakeholders acting on the same geographical or administrative entity (WP1). Our approach will mobilize different tools facilitating dialogue and discussion as elaborated in the individual work packages.

The semi-arid biophysical environment that characterises the Limpopo Basin provides an important backdrop to the various innovations. This explains why there have been efforts by research institutions and NGOs to increase rainfall productivity through water harvesting, for example. While the innovations are technically effective (see Twomlow and Hove, 2006) they have been affected by socio-economic issues such as labour availability and resource endowment (Ncube et al, 2009; Munamati and Nyagumbo, 2010) and also water resource availability (Moyo et al, 2006). The same observation can be said about conservation farming, which is compounded by the conceptual uncertainties of the term (Giller et al, 2009). Notwithstanding the importance of finding ways to technically improve agricultural production, it is widely recognised that this alone is not enough. There is a need to look at the entire value chain, hence attempts to link farmers with markets and consider various formations such as contract farming. However, markets are subject to social and cultural aspects, which are often underestimated in traditional economics. Research conducted under the auspices of PN17 and PN66 found that water and agricultural management at the local level was mostly mediated by informal institutions and that sometimes formal institutions were less important in securing rural livelihoods, more so because these tended to be manipulated by powerful actors (Manzungu et al, 2009b). Tapela's (2010) work in the Limpopo basin in South Africa found that contract farming arrangements benefited a few farmers to the detriment of other farmers, for example women farmers involved in 'non-commercial' crops had their land expropriated in favour of commercial farming. There was no obvious recourse available to the women. To this end Work Package 2 and 3 will examine water governance praxis at water points and farm level respectively focusing on emerging institutional arrangements and how these promote rural farming livelihoods.

This project builds on the farming and village level water governance research of PN1, PN17 and PN47 along with the infrastructure-focused water governance research of PN28, PN46 and PN66. Several of the projects had an upscaling component which also informs this project. This project builds on the work done in Phase 1 to concretise links between local levels and the formal regional and river basin organizations.

6. Links to other BDC projects

Research outputs	**Dependencies on other BDC projects to produce it**	**Risks and assumptions**
Contribute towards integrated governance (including policy & financial) framework options that impact rural livelihoods	Inputs and collaboration from L1, on targeting sites for governance investigations	Willingness of governance actors at different levels to collaborate
Improve sustainability and resilience of useful water point infrastructure through contextualised improved governance	Working closely with CPWF-L2/L3	Working closely with CPWF-L2/L3, L2 to provide ground for governance analysis and assessment to L4 in terms of infrastructure rehabilitation and enabling environment for appropriate sustainable management of SWI
To increase access to and control of water, land and other resources at farm/village level through action research	Working closely with L3/L2, L3 to bring on board the practical and market oriented approach to the	L4 to get the opportunity to reflect on governance aspects of other issues associated with water and food production such

into institutions, policies and linkages to higher level decision-making	overall project	as land and economies
A gender balanced approach to harmonise green water, blue water and infrastructure planning at farm & village level	Working closely with CPWF-L1,L2 and L3	Gender approach to be included, greater integration between the project work packages
To harmonise green water, blue water and development management and planning at government level	Working closely with CPWF-L2 and L3	Cooperation and support from national and regional actors
To assure quality and consistency for the three work packages	Working closely with CPWF-L5 project	Partners are expected to collaborate and adhere to high standards.

7. Suggested sites

The project will work in Lotsane (Botswana), Mabalane (Mozambique), Lambane and Nebo plateau (South Africa), Insiza and Gwanda (Zimbabwe).

A major criterion in site selection has been the need to work together with other projects (B6). Given the late development of this proposal in relation to the other Limpopo projects, sites have been selected by negotiation with the other projects who had already selected sites, followed by field visits to confirm relevance of the proposed sites, in terms of factors including a mixture of green and blue water use, villages with primarily agricultural production and sufficient similarities to allow cross-site learning.

8. Project Outcome Pathways

See project workbook, Outcome Logic Model OLM worksheet

9. Activities and Implementation Plan

See project workbook, Gantt Chart worksheet

10. Communications

We see this operating at four levels:

1. Local level: Knowledge dissemination and capacity building will occur through interaction between L4's partners and local end-users working together in the fieldwork and case studies. The farmers and RBOs will be directly engaged in the research and local government, extension services and NGOs shall be involved.
2. National level: Relevant river basin organisations are either project partners (e.g. MCC) or closely-associated participants (e.g. LIMCOM). The same is true of other end users such as the Limpopo Department of Agriculture (South Africa) and AGRITEX (Zimbabwe), with whom work package 2 will work closely. Thus (sub)national end users will be engaged throughout the project, without the need for outreach to them at the end. From the beginning, end users will be briefed by researchers on activities and findings, and encouraged to participate in appropriate events. Three master students will be recruited from within the end user group, and trained in the WaterNet IWRM master programme. These students will participate in research in work package 1 -3 (one each), working directly on research that they will be able to take up into their institution's program on their return to work after graduation.
3. Regional level: In collaboration with L5, L4 outputs shall be presented to governmental, transnational and non-governmental stakeholders at appropriate regional fora, including the FANRPAN dialogues, WaterNet/WARFSA/GWP-SA Symposia and SADC technical committee meetings. Policy briefs shall be prepared and discussed with the appropriate officials. Short training courses will be held in each riparian state at the end of the project, to assist in the uptake of outputs of work packages 2 and 3.
4. International level: journal articles and working papers will be disseminated at international venues (conferences and workshops). A working paper series on socio-economic issues, including research methodologies, will be produced and widely disseminated in the region. See the Gannt chart for journal articles associated with outputs.

PART C: CONSORTIUM DETAILS, INDICATIVE BUDGET AND REFERENCES

11. Consortium Details

Names of team members	Professional discipline	Institutional affiliation and address
David Love	Water resources management Capacity building	WaterNet Secretariat PO Box MP 600 Harare Zimbabwe
Jean-Marie Kileshye Onema	Water resources management	WaterNet Secretariat PO Box MP 600 Harare Zimbabwe
Jacqui Goldin	Anthropologist, water governance and gender	SADC WaterNet Professorial Chair, Institute for Water Studies, Faculty of Natural Sciences University of the Western Cape
Stefano Farolfi	Water governance and economics	IWEGA -Universidade Eduardo Mondlane, Caixa Postal n. 3647, Maputo Mozambique
Raphaele Ducrot	Water institutions	IWEGA-Universidade Eduardo Mondlane, Caixa Postal n. 3647, Maputo Mozambique
Everisto Mapedza	Social scientist	IWMI-141 Cresswell Road, Silverton 0184, Pretoria, South Africa
Emanuel Manzungu	Water infrastructure and governance	Dept. of Soil Science, University of Zimbabwe, PO Box MP167, Harare, Zimbabwe
Vupenyu Dzingirai	Applied social sciences	CASS, University of Zimbabwe, PO Box MP167, University of Zimbabwe,Harare,Zimbabwe
Tommy Rosen	Water management	Mzingwane Catchment Council, Box 2880 Bulawayo, Zimbabwe

Provide a brief text statement on why the lead institution is well-placed to lead the group.

IWEGA is the International Center for Water Economics and Governance in Africa (IWEGA) and was established in May 2009 at the University Eduardo Mondlane in Maputo. Its mission is "to enhance the capacity of African researchers to conduct water economics and governance inquiry of relevance to African problems and increase the awareness of environmental and economic managers and policy makers about the role of water economics and governance for sustainable development". IWEGA will lead the first work package and coordinate linkage with the Limpopo Water Course Commission (LIMCOM) – a principal end user of the project.

IWMI is the International Water Management Institute (Southern Africa office). IWMI has substantial capacity in integrated water resources management research and the southern Africa office has a substantial emphasis on social and institutional aspects of water management. It is from their team that the Multiple Use System concept emerged and IWMI shall lead the second work package, which focuses on the governance aspects of multiple use water points.

The University of Zimbabwe (UZ) is the premier state university of Zimbabwe and has several departments with substantial experience in community-based natural resources management. UZ

teams have led institutional research in CPWF Phase 1 and are well-placed to build on previous research and existing relationships. UZ will lead the third work package, focusing on governance at farm and village scale and linkages to the river basin organisations.

WaterNet is the lead organization in L4. WaterNet is a regional network of university departments and research and training institutes specializing in water. The network aims to build regional institutional and human capacity in Integrated Water Resources Management (IWRM) through training, education, research and outreach by harnessing the complementary strengths of member institutions in the region and elsewhere. WaterNet member institutions have expertise in various aspects of water resources management and are based in Southern and East Africa. WaterNet is a strategic programme of the Southern African Development Community (SADC) Water Sector, and is an associated programme of the Global Water Partnership (GWP).WaterNet is an active partner in various regional and global networks and is referred to as an example of how to design and implement capacity building in water for sustainable development and a best practice for network projects. WaterNet's greatest assets are their research experience in the region and their network of experts. WaterNet will lead the fourth work package and triangulate the science between the three other work packages. Note: IWEGA, IWMI and UZ are WaterNet members.

12. Indicative breakdown of budget

See project workbook, WORKSHEET L4_$_by_Output, summary L4_$_by_Institution]

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